

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 57, 58, 62-67, 69-75, 77-83, and 85-101 are presently active; Claims 57, 58, 62, 69, 70, 77, and 78 having been amended, Claims 42-56, 59-61, 68 and 76 having been presently canceled without prejudice, and Claims 86-101 have been added by the present amendment.

In the outstanding Office Action, Claims 57-76 were rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. Claims 57-76 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description. Claims 77-85 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jinriki et al (Jap. Pat. No. 02-283,022) in view of Usuki (U.S. Pat. No. 914,151) or Hiramoto et al (U.S. Pat. No. 5,510, 158). Claims 57-76 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jinriki et al in view of Jap. Pat. No. JP1-298,003A or Harada et al (U.S. Pat. No. 5,792,326).

Regarding the present claim amendments and non-limiting support for the present claim amendments, the added feature of a showerhead having pipes arrayed to form a grid, as recited in Claim 57 and so forth, is supported by FIG. 15 and the corresponding part in the specification. Claims 57 and 69 have been amended to remove the subject matter concerning N₂ gas for increasing generation efficiency of ozone. Claim 58 has been amended to remove the feature of a plasma generating system. Claims 62 and 70 have been amended to include the subject matter concerning N₂ gas for increasing generation efficiency of ozone that was removed from Claims 57 and 69. The positional relationship between the showerhead and

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UV radiating system recited in new Claims 86 and 87 and so forth is supported by FIG. 14 and other drawings, and the corresponding part in the specification. The subject matter recited in new Claim 86 and so forth of "the pipes arrayed to form a grid of the showerhead has a projection area projected on the target process object, which is smaller than 20% of a surface area that the target process object has" is supported by the description on pages 51 and 52 in the specification. The worktable rotation recited in new Claim 94 is supported by the description on page 52 in the specification. The subject matters recited in new Claims 95 to 101 are supported by FIGS. 17 to 19 and the corresponding part in the specification. Thus, no new matter has been added.

Regarding the 35 U.S.C. § 112, first paragraph, rejection to Claims 57-76, Claims 59-61 have been canceled. Further, regarding Claims 57 and 69, these claims have been amended to clarify that the process gas is excited in the process vessel by a gas exciting system to generate active oxygen atoms. Processes for exciting the process gas are describe in Applicants' specification, page 29, line 14, to page 30, line 26. Configurations for exciting the process gas are shown in Applicants' Figure 9 by coupling of microwaves from the microwave generation means 266 through the transmission window 256 into the process vessel and/or by irradiation from the mercury lamp 264 through the transmission window 256 into the process vessel. Thus, it is respectfully submitted that, with these amendments and explanations, the 35 U.S.C. § 112, first paragraph, rejection has been overcome.

Regarding the 35 U.S.C. § 112, second paragraph, rejection to Claims 57-76, the above noted changes to Claim 58, the cancellation of Claims 59-61, and the removal of the term "small quantity" from Claims 57, 62, 69, and 70 makes this rejection moot. Thus, it is

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respectfully submitted that the 35 U.S.C. § 112, second paragraph, rejection has been overcome.

Independent Claims 57, 69, 77, and 90 include a subject matter concerning a showerhead having pipes arrayed to form a grid. Applicants submit that this showerhead can supply a process gas to a target process object more uniformly, as compared to a simple gas supply nozzle or ring showerhead. As a consequence, a metal oxide film formed on the surface of the target process object can be subjected to the defined modifying process with planar uniformity.

More particularly, the showerhead is effective, where the positional relationship between showerhead and UV radiating system, and the projection area of the pipes arrayed to form a grid are set, as recited in new Claims 86, 88, and 92. As such, it is possible to efficiently use energy of UV rays, and to reduce problems caused by exciting a process gas in the showerhead.

None of the applied prior art references discloses a modifying process that utilizes a showerhead having pipes arrayed to form a grid. For example, of the references of record only Sekiguchi et al, cited in the previous Office Action and overcome as being nonanalogous art, disclose a ring showerhead, which supplies a process gas to a target process object less uniformly. Hence, independent Claims 57, 69, 77, and 90 and the claims dependent therefrom are believed to patentably define over the applied prior art.

New independent Claim 95 includes the subject matter "the process gas is supplied to form a horizontal gas flow above the target process object." According to this arrangement, Applicants submit that the process gas flow can be formed close to the target process object,

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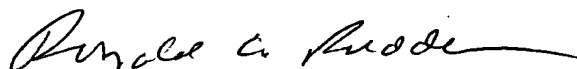
so that a process gas and the energy from the active oxygen generating system are efficiently used. Furthermore, when the process is performed while forming a horizontal laminar gas flow is formed on the target process object, a metal oxide film can be subjected to a modifying process with a higher planar uniformity.

In this respect, none of the applied prior art references discloses a modifying process that utilizes a horizontal process gas flow above the target process object. Hence, independent Claim 95 and the claims dependent therefrom are believed to patentably define over the applied prior art.

In view of the present amendment and in light of the foregoing discussion, it is respectfully submitted that the pending claims are allowable and that the case is in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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